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I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004901453 for a patent by YARRA RIDGE PTY LTD as filed on 19 March 2004.



WITNESS my hand this  
Fourteenth day of July 2004

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## DESCRIPTION OF THE PREFERRED EMBODIMENTS

### Definitions and Conventions Employed

This specification and the provisional applications associated with this application, describe inventions comprising improved complete locks for displaceable wings and improvements for locks for displaceable wings that (for convenience) are referred to herein as "locks". Throughout this specification and claims which follow, unless the context requires otherwise, the word "locks" or variations such as "lock" will be understood to imply the inclusion of complete locks for displaceable wings and improvements for locks for displaceable wings that are transportable into other locks and locking devices without being limited to the complete locks described herein.

This specification describes locks substantially as described herein with reference to and as illustrated in the accompanying drawings.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

Throughout this specification and claims which follow, unless the context requires otherwise, the positional prepositions such as rear, forward are used to assist in description of the preferred embodiments and with reference to the accompanying drawings and have in general no absolute significance.

Throughout this specification and claims which follow, unless the context requires otherwise, the word "preferably" or variations such as "prefer" does not mean nor infer that the inventions described in the "Description of the Preferred Embodiments" are necessarily restricted to the form of an integer or collection of integers referred to as preferred. Preferably means, one of multiple acceptable alternatives.

Throughout this specification and claims which follow, unless the context requires otherwise, the words wing embraces both doors and windows.

Throughout this specification and claims which follow, unless the context requires otherwise: latching means displacement of an engaging member against biasing means by an engageable means and subsequent displacement of the engaging member into engagement with the engageable means under the action of a biasing means, [(within this application) for hinged doors this comprises (rectilinear and/or angular) displacement of a latch bolt or {advanced latch bolt and an auxiliary bolt as defined below} towards the lock casing by the strike plate and subsequent displacement of the latch bolt into the aperture of the strike plate (and in conventional forms this comprises displacement of the latch bolt by a curved or angled wing or lip

of the strike plate), and for sliding wings this comprises 1) (rectilinear and/or angular) displacement of an engaging member having a hooking portion towards the lock casing and subsequent displacement of the engaging member behind a shoulder of the catch plate to enable the hook to overlap the shoulder whereby to longitudinally engage the catch plate, 2) displacement of an auxiliary bolt towards the casing to release an engaging member having a hooking portion to displace (rectilinearly and/or angularly) to a position behind a shoulder of the catch plate to enable the hook to overlap the shoulder whereby to longitudinally engage the catch plate, 3) rectilinear displacement of an advanced latch bolt (as defined below) with hooking arms and an auxiliary bolt towards the lock casing by the catch plate and subsequent displacement of the latch bolt into the aperture of the catch plate and displacement of each hooking arm behind the peripheral edge of the aperture to overlap the peripheral edge whereby to longitudinally engage the catch plate; within this application a latch bolt is displaceable between an operative position or configuration in which it is engageable with an engageable means (in the case of hinged doors this commonly comprises a fully extended bolt within the aperture of a strike plate) and a retracted position where it is removed from the said engagement (in the case of hinged doors this commonly comprises withdrawn from the aperture), the retracted position coinciding with the bolt being substantially within the casing and the operative position embracing a bolt that is substantially fully extended; a latch-bolt or latch bolt is an outwardly biased bolt capable of executing (or participating in) latching (and includes both rectilinearly displaceable and angularly displaceable bolts) and includes bolts having a leading end that is chamfered or otherwise profiled on one side to facilitate latching and includes advanced latch bolts (both pivotal and rectilinear) that are restrained in a pre-latching configuration prior to latching to either facilitate or assist latching and that are accompanied by an auxiliary bolt, said advanced latch bolts in some forms comprising a prism shaped bolt that in some forms include counter-acting hooks, said advanced latch bolts in some forms having a leading end that is chamfered, curved or otherwise profiled on both sides to assist or facilitate latching; an auxiliary bolt means an outwardly biased plunger that is operably associated with the advanced latch bolt; unlatching means withdrawal of the latch bolt from engagement with the engageable means, (for hinged door it commonly means withdrawal of the bolt from the aperture of the strike plate); an unlatching lever is a lever or knob that is hand operable to cause the latch bolt to become unlatched; locking means configuring the lock to restrain it from being unlatched and in some forms of locks employing deadlocking slides, it includes restraining the deadlocking slide to restrain the bolt from being inwardly displaced by

the unlatching lever; deadlocking means to configure the lock to restrain the bolt from being displaced from the operative configuration (in the case of a rectilinearly displaceable bolt for a hinged door, it commonly means restraining the bolt in a fully extended position), the deadlocking means in some forms includes a deadlocking slide that is displaceable to cooperate with the bolt to restrain it against displacement; deadlocked means the bolt cannot be displaced from the operative position by external forces; deadlatching means the bolt is automatically deadlocked during latching; remote lock means a locking means disposed from the lock that includes a remote engaging member that is operably connected to the lock (often there is an upper and a lower remote bolt situated above and below the lock); French Door means a door comprising a frame with a glass in-fill and often configured in pairs, a second door that is normally closed and is secured by vertical bolts and a first door that has the lock body and operable levers, often they have a strip of compressible sealing material located on the edge against which the first door closes to prevent energy loss, many French Doors comprise a hollow frame where the hollow within the frame is comparatively small in depth; Security Doors means a door comprising a hollow framed door with an in-fill of mesh or woven stainless steel where the hollow within the frame is comparatively small in depth and in width; lock body is the lock portion fitted within the hollow frame of the wing, the lock body together with a strike plate, a pair of handle sets and a cylinder comprising a typical mortice lock; depth of lock body is the extent of the lock body in a direction parallel to the face of the door; width of lock body is the extent of the lock body in a direction at right-angles to the face of the door; single cylinder is a cylinder comprising a key operable barrel within a cylinder housing operably connected to a first cam (in one form and commonly having a radially protruding arm); double-cylinder comprises opposed barrels each operably connected to the same first cam; clutched-double-cylinder comprises a cylinder having opposed barrels each connectable without free movement to the same first cam such that the cam can be angularly displaced by a barrel while the other barrel remain undisplaced, the cylinder includes a clutch to select which barrel is the operative barrel, said clutch being operated by key insertion; free rotation single cylinder is a cylinder comprising a key operable barrel within a cylinder housing operably connected with free movement to a first cam to enable the cam to be displaced by barrel to a locking configuration and then the barrel to be reverse rotated to an undisplaced position enabling key removal; free rotation-double-cylinder comprises opposed barrels each connected with free movement to the same first cam such that the cam is free (between limits) to be angularly displaced while the barrels remain undisplaced, this type of cylinder being commonly used in security

door locks in Australia to enable the cam to be displaced by either barrel to a locking configuration and then the barrel to be reverse rotated to an undisplaced position enabling key removal while leaving the first cam in the locking position, (this type of cylinder being distinct from the more commonly used double cylinders that employ; in forms of both clutched and free rotation cylinders, a barrel is replaced by a hand operable turn knob; some single cylinder comprise a subassembly including a housing while in others, the housing comprises part of the handle backset, and some comprises a separate member and some double cylinders comprise a subassembly including a housing while in others, the double cylinder housing comprises portions of the handle backplate; a pivotal lock is defined herein as a lock having an angularly displaceable bolt herein called a pivotal bolt; a rectilinear lock is defined herein as a lock having a rectilinearly displaceable bolt herein called a rectilinear bolt.

#### **Description of the Figures**

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig 1 is an isometric view of a handle set when viewed from the underside configured as left handed and downwardly displaced to the maximum normal operating disposition,

Fig 2 is an isometric view of a handle set when viewed from the underside configured as left handed and upwardly displaced to the maximum normal operating disposition,

Fig 3 is an exploded view of Fig 1,

Fig 4 is the handle assembly of Fig 1 with the lever displaced 80 degrees to release the stronger spring,

Fig 5 is the handle set of Fig 1 configured as right handed.

This application relates to the provisional application filed 12/1/04 by Yarra Ridge [Watts J R 2004 900111] that is included herein by reference. This application (employing the nomenclature, numbering and definitions of 2004 900111) describes an improvement to the method of springing the lever described in that application).

As stated in that application the inventions with this specification are not just limited to addressing inadequacies previously described and they are applicable to locks in general and to the spring biasing and control of displaceable levers in general.

This springing method for the levers is applicable to other locks including those described in the provisional application cited in the Complete Application citing this current application.

According to the invention, there is an unlatching lever having a substantially cylindrical shank portion 237 that is supported within a substantially cylindrical through aperture 238 in an substantially cylindrical underside boss 239 of the lever backplate 240, the aperture having an opening to the face of the back plate and terminating within the underside of the backplate in a circular annular washer-face 241. The shank preferably has a sideways protruding retention shoulder 242 and underside boss is longitudinally slotted 243 to provide passage for the retention shoulder – the slot 230 and retention shoulder being configured such that in normal operation they are never aligned. In usage, the shank is fed through the slot and it is then rotated so that the retention shoulder abuts the annular washer-face. In other handle sets, the lever is retained by a circlip fitted to the shank of the lever beneath a disc-like member as is common.

The invention provides a springing system for a lever that provides for simple and ready conversion between handed types and without the use of hand tools. It provides biasing for a lever that biases the lever towards an undisplaced disposition irrespective of the direction in which it has been displaced from the undisplaced disposition.

In some embodiments, the lever is attached to the disc-like member supported on the lever shaft on the underside of the backplate. The disc-like member having inwardly projecting substantial radial fingers that locate in longitudinally elongated slotted recesses of the lever shaft to couple the disc-like member and lever shaft. The disc-like member at a position radially disposed from the lever pivotal axis is connected to an extended softer spring defined in part by a longitudinal axis that does not intersect the axis of the rotation of the lever, the spring giving rise to a moment on the lever-disc-like member sub-assembly urging it to rotate in a first direction. The disc-like member at a position radially disposed from the lever pivotal axis is also connected to a substantially unextended harder spring defined in part by a longitudinal axis that does not intersect the axis of the rotation of the lever, the spring giving rise to a moment on the lever-disc-like member sub-assembly urging it to rotate in a direction opposite the first direction. The stronger spring in this function acting as a solid member whose length is configured to retain the sub-assembly in an undisplaced disposition (commonly a horizontal lever) and biased towards that position by the softer spring. The stronger spring in manufacture is preferably wound to be pre-tensioned so that an initial load must be applied to the spring before it extends at all.

In a preferred embodiment, the lever comprises the lever described above having the protruding retention shoulder 242 and the disc-like member comprises a

cupped member 244, enveloping the underside boss and having an axial aperture 245 to provide passage to and to mate with a drive shaft 246 that also mates within an axial drive recess 120 of the shank to thereby operably couple the cupped member and lever. The cupped member includes sideways disposed opposed side apertures 249 disposed from the pivotal axis of the lever

One of the apertures 250 disposed towards the lever arm is occupied by a right-angled return portion 251 of a vertically elongated extended tension spring 252 that is connected at the upper end to a rail 253A of the underside of the back plate, the spring urging the cupped member to rotate about its axis and hence the unlatching lever to displace upwardly; the spring having a return portion 400 on the other side of the rail to comprise a U shaped spring end 401 so as to be retained adjacent the rail. The other apertures 254 disposed away from the lever arm is occupied by a right-angled return portion 255 of a vertically elongated much stronger (substantially unextended) tension spring 256 that is connected at the upper end to the rail 253A, the stronger spring acting as a stop means to restrain the cupped member against rotation from the undisplaced position of the cupped member by the softer spring, the spring having a return portion 402 on the other side of the rail to comprise a U shaped spring end 403 so as to be retained adjacent the rail.

In usage, downward displacement of the unlatching lever, as shown in Fig 1, causes the softer spring to stretch more (to urge the cup with even greater force towards the undisplaced disposition) while the stronger spring exerts no force being displaced upwardly substantially as a rigid member as the U shaped end 403 of the stronger spring slides over the rail while being retained adjacent the rail; and upwards displacement of the unlatching lever, as shown in Fig 2, causes the harder spring to stretch and the softer spring to become less stretched with the overwhelming force of the stronger spring urging the cup towards the undisplaced disposition.

During fitting the handle set is converted between left and right handed configuring by removing the shaft and rotating the lever to a downwards position beyond the normal operating range (in which it is retained by the shaft) as shown in Fig 4. The stronger spring is configured such that the return 402 is from behind the rail when the lever is so downwardly displaced to enable the spring end 403 to be disconnected from the rail. The lever is then further displaced to cause the portion of the softer spring adjacent the end 251 to displace towards the drive shaft recess. When this portion of the softer spring has displaced to be past the pivotal axis of the shaft recess, the stronger spring end 403 is re-attached to the rail by placing the end portion 402 behind the rail on the rail. Lever displacement back into the normal

operating range causes the U shaped end 403 to be engaged with the rail as described above and so the lever displaces towards the undisplaced position the spring end 401 displaces outwardly by sliding along the rail to assume an undisplaced position that is on the opposite end of the rail from which it was before re-handing and the portion strong spring adjacent the end 403 is similarly displaced to an end of the rail opposite that from which it was released.

To minimize friction in usage, the cupped member is preferably supported by the shaft only. During fitting of the lock, as the drive shaft is assembled through the cupped member, the cupped member is slightly displaced to be supported by the shaft with operating clearance between the cupped member and the underside boss so that friction exerted on the moving assembly of cupped member, unlatching lever and drive shaft is minimized. Until the drive shaft is inserted, the cupped member abuts the boss to be supported by the boss.

The rail, as shown in Fig 1, comprises a simple, horizontally elongated member 405, preferably cylindrical in form, having a right angled return portion 406 at each end that are inserted into apertures 407 in the underside of the backplate to be retained there by friction and/or the side wall of the wing to which the handle assembly is attached.



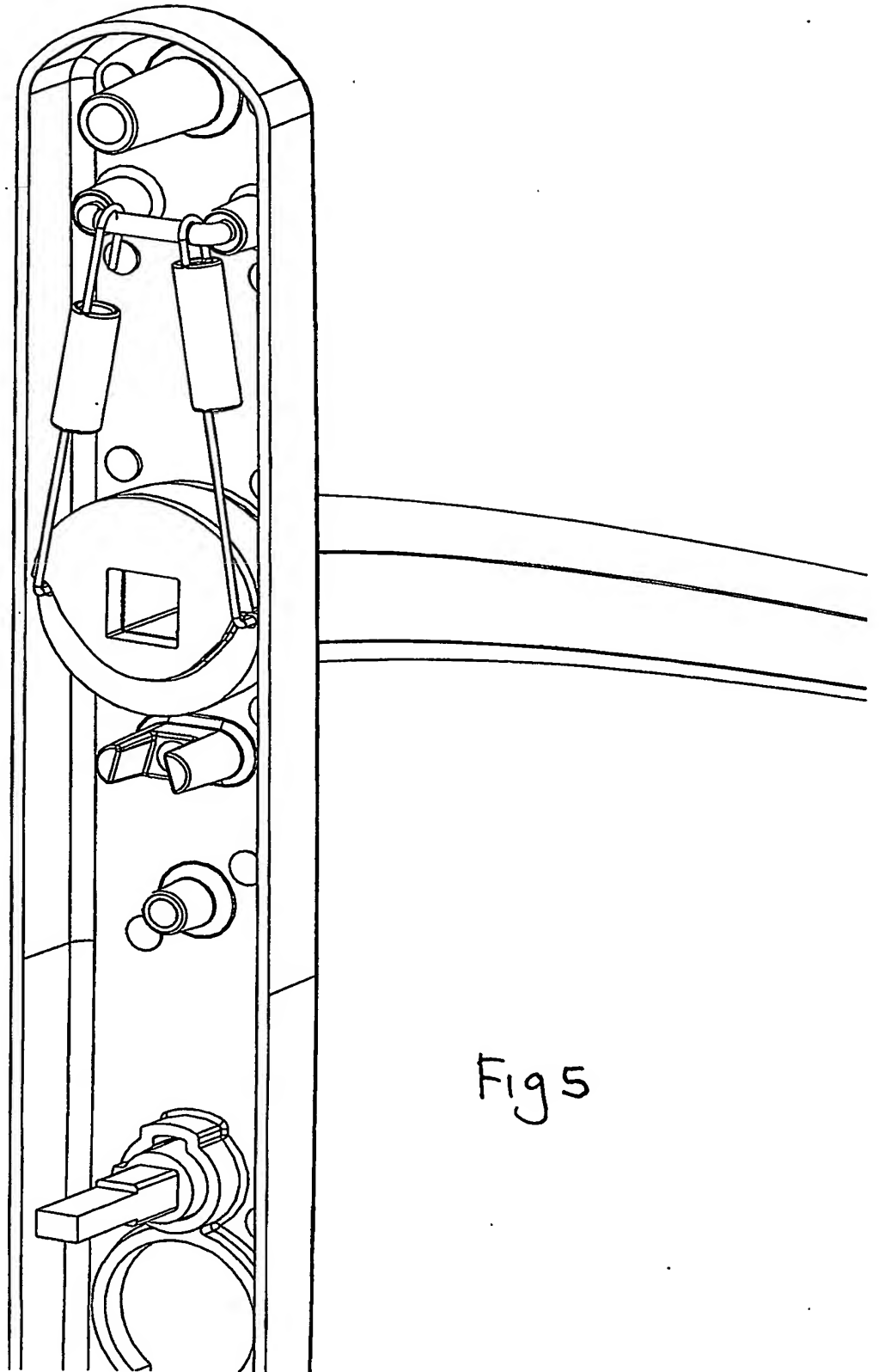


Fig 5

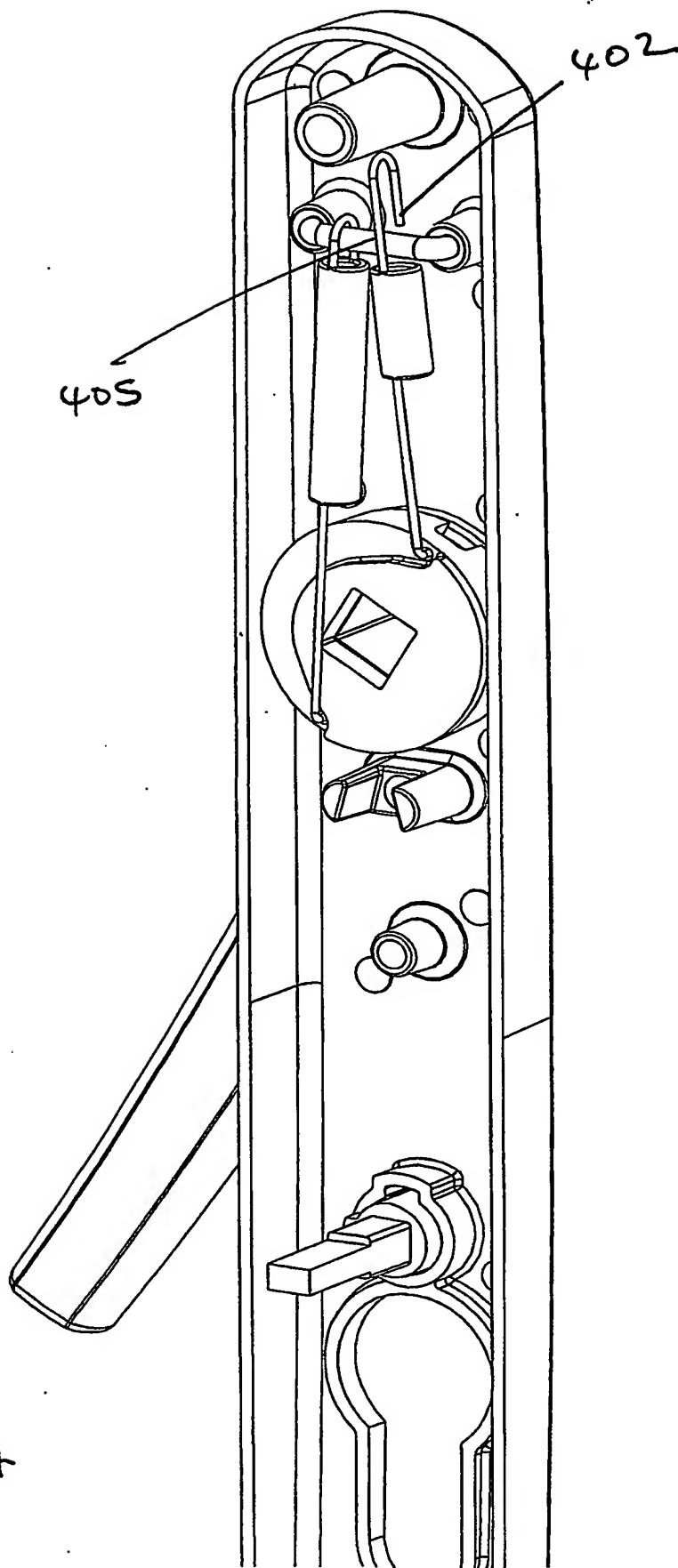


Fig 4

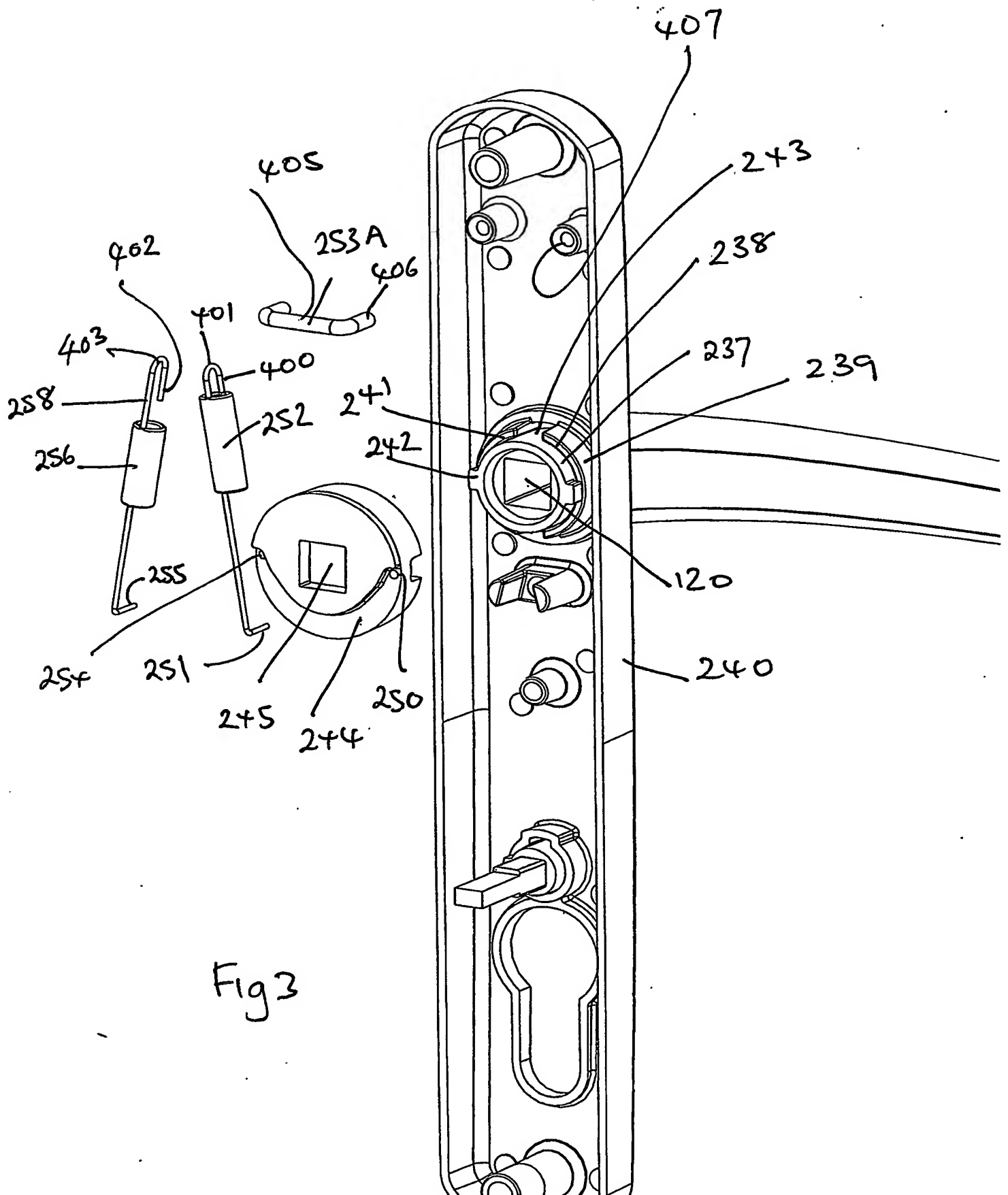


Fig 3

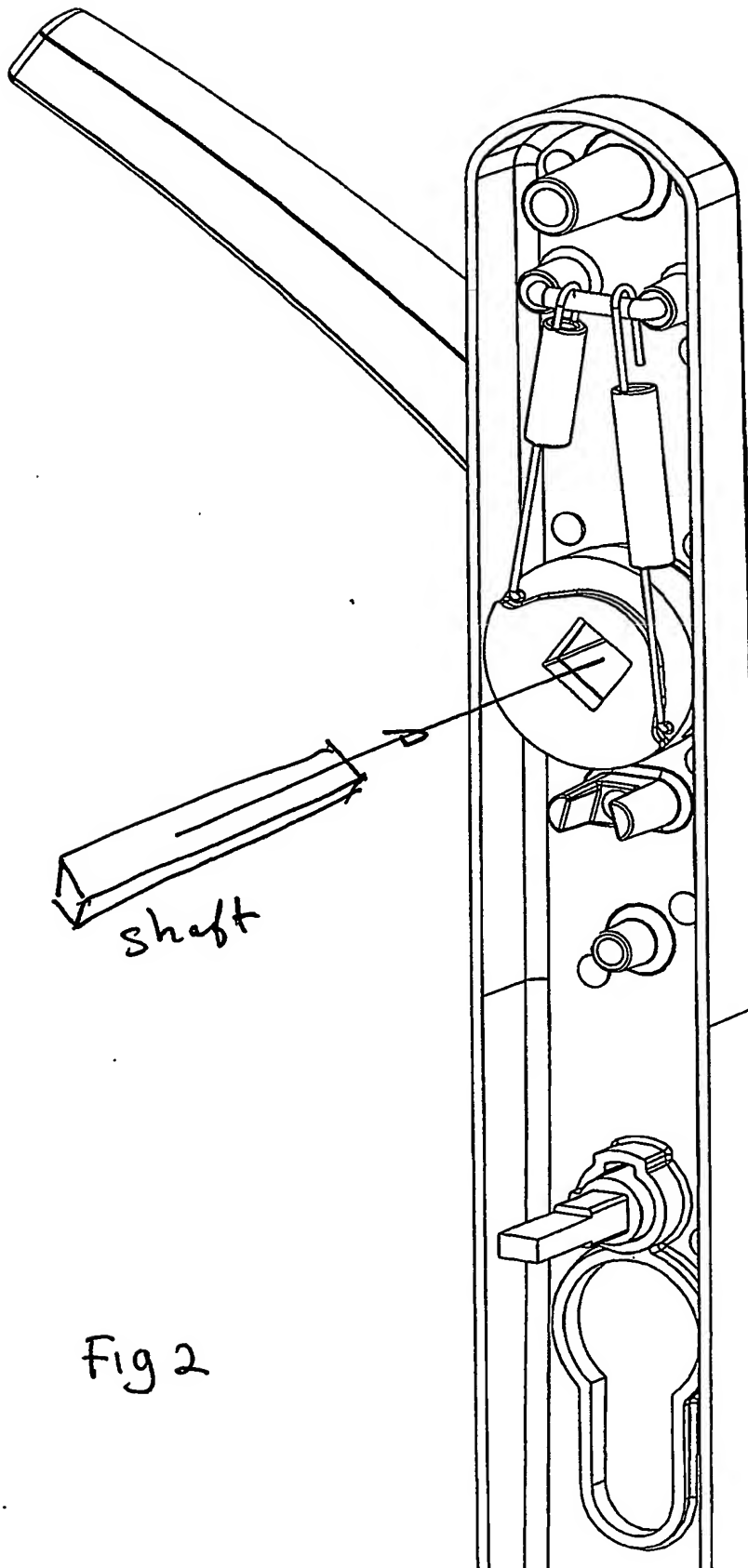
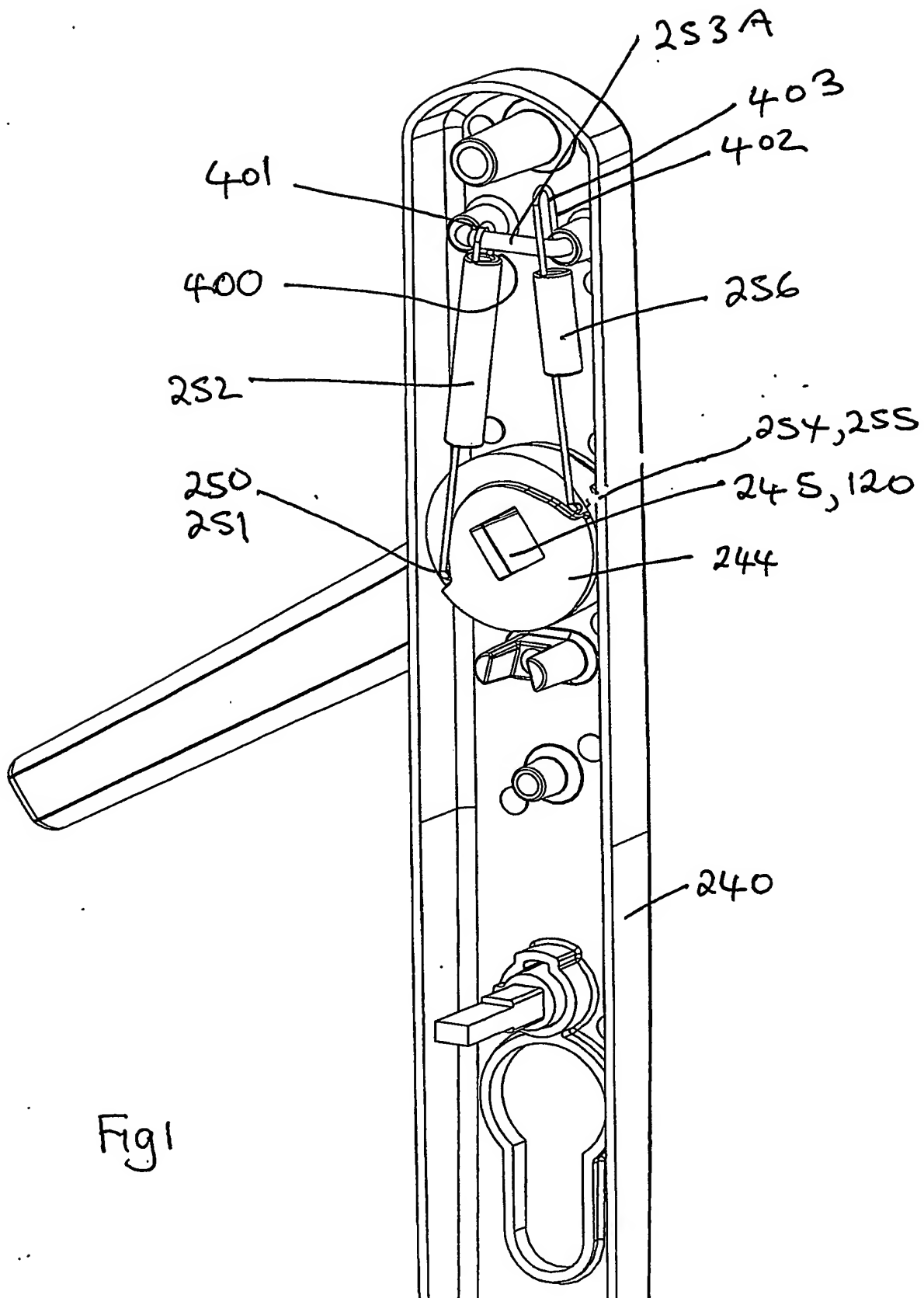


Fig 2



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